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09/630,315	07/31/2000	Naoto Kinjo	058744	5533

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EXAMINER
SETH, MANAV

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>25 April 2005</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1,8,15-29,38-41,43,45-51,53 and 57-61</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>2-7,9-14,30-37,42,44,52 and 54-56</u> is/are allowed.

6)☒ Claim(s) <u>1,8,15-29,38-41,43,45-51,53 and 57-61</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Applicant's amendment filed on April 25, 2005, has been entered in full.

2.   Applicant's arguments on pages 18-26 in amendment filed April 25, 2005, with respect to the rejection(s)of claim(s) 15-26, 38, 39, 45 and 46 under 35 U.S.C. 102(b) and with respect to claims 1, 8, 27, 40, 41, 43, 28 and 29 under 35 U.S.C. 103(a) respectively, have been fully considered but are not persuasive. Applicant's arguments on page 22 of the amendment with respect to the rejection(s) of claims 2 and 9 has been fully considered and they are persuasive and therefore the rejection on claims 2 and 9 have been withdrawn.

Response to Arguments

3.   Applicant's arguments regarding the prior art rejections on claims 15-26, 38, 39, 45 and 46 under Saber on pages 18 and 19 of the Amendment filed on April 25, 2005, have been fully considered but are not persuasive.

4.   In the last paragraph of the page 18 and 1st paragraph of page 19, Applicant argues in substance:

a. "In Saber, a first extraction area is obtained by an adaptive color classification algorithm and is not obtained according to a shape of regular geometric form. In particular, the fitting of eigenvalues and eigenventures into an ellipse does not occur until after skin classification" and "Applicant submits there is

<u>no disclosure of extracting a plurality of extraction areas as candidate specified</u>

<u>image subject regions in Saber" as recited in claim 15.</u>

Examiner respectfully disagrees. First of all, examiner answers a general question that would illustrate more on the current issues in the examination of this application. The question is: how would a system using a method will extract a subject, for example a human face, in an image, without identifying the subject in the image?. Examiner here asserts that a system cannot extract a human face in the image without identifying the face before, in the image and it is well known technical fact in the art of image processing. If it was a human, he/she would directly view the image and identify the face and draw the ellipse/circle around the face but if the same thing is to be done by a computer or a system, it cannot do what a human being does, a system has to identify the face of a human in the image using image characteristics. It is well known that to identify the face in the image using a system, image segmentation is required to separate the face from rest of the image and as well known image segmentation is done in various ways, which involves edge-based binarization, color based segmentation and applicant's specification recites the same in the 2nd last paragraph of page 28, where is uses edge extraction, as cited below by the examiner.

> The face contour/circular shape extracting section 78 implements an edge extraction and a circular shape extraction using a face contour/circular shape extracting algorithm thereby extracting a face region as the specified image subject. That is, a human face is ordinarily elliptical so that the face contour/circular shape extracting section 78 extracts an elliptical or circular shape portion that is estimated to represent the human face and designates it as a candidate face region.

Applicant further clearly cites the edge extraction being nothing but image segmentation using binarization in 2nd paragraph of page 29 of the specification, as cited below by the examiner. The citation from the specification clearly educates that the face is extracted after the segmentation of the image, which is done using binarization or other techniques. Also, Examiner further asserts that applicant had admitted in the cited part of the page 29 of the specification, that this technique is from Published Japanese Patent Application No. 08-184925, and this application was published on July 16, 1996, which qualifies as a prior art.

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Unexamined Published Japanese Patent Application (kokai) No. 8-184925 can favorably be used.

This technique is to extract only the region corresponding to the human face without being affected by the colors of the regions corresponding to the human face and the neighborhood thereof in the image. Image data is taken in and divided into a plurality of regions by binarization or other techniques; then, a pattern representing a human head contour, a pattern representing the human face contour, a pattern representing an internal structure of the human face and a pattern representing a human body are each detected from a plurality of the thus divided regions; then, candidate face regions are set in accordance with the respective detected patterns; weight

Saber clearly teaches "the algorithm consists of: 1) supervised skin/non-skin color classification, 2) shape classification and 3) eye, nose, and mouth localization" in (page 655, left column, 2nd paragraph) and further clearly teaches "First, an adaptive color classification algorithm is applied to the E and S channels to segment the image into two classes: skin and "other"" in (page 655, left column, 3rd paragraph). In the above disclosure by Saber, it clearly shows face identification by segmenting the image into skin portion and non-skin portion (the other part of the image) before extracting the area, **same as done by the applicant.** Saber clearly teaches shape classification, which extracts first extraction area according to the shape of regular geometric form of the specified image object by teaching "Then, the

eigenvalues and eigenvectors of the skin spatial covariance matrix are utilized to fit an ellipse to the skin region. The Hausdorff distance is employed as a means for comparison, yielding a measure of proximity between the shape of the region and the ellipse model" (page 655, left column, third paragraph) and further support can be found on page 656, left column, first paragraph and use of ellipse is well known as a shape of regular geometric form. Saber further teaches that once the face pattern is identified, eyes, nose and mouth can be extracted and this further has been emphasized by Saber in figures 1, 2 and 3, **thus conforming to the limitation "for each extraction area a plurality of extraction areas as candidate image subject regions" as recited in claim 15**.

Examiner concludes that one of ordinary skill in the art would require image segmentation to identify the subject in image before it is extracted by using and this is evident from the above citation from the applicant's own specification and teachings provided by Saber. Therefore, claim 15 still stands rejected under the same prior art reference "Saber et al". There is no substantial arguments provided for claims 16-26, 38, 39, 45 and 46, therefore these claims stand rejected.

5.   Applicant's arguments regarding the prior art rejections on claims 1, 8, 27, 40, 41 and 43 under Nguyen and Saber on pages 19-21 of the Amendment filed on April 25, 2005, have been fully considered but are not persuasive.

6.   In the 4th paragraph of the page 20, Applicant argues in substance:

   b. "Assuming arguendo, Saber teaches the claimed precedent stage extracting
a shape of regular geometric form of the specified image subject, the combination of
Saber and Nguyen is not obvious".

Examiner respectfully disagrees. Examiner first of all illustrates on the word
"precedent" used in the claim 1 and all other respective claims. The word as well known
stand for previous or as per the claims to the previous stage. Now, emphasizing on the claim
1 which recites a precedent stage (i.e. previous stage or a stage before), which extracts a
shape of regular geometric form of the specified image subject under a predetermined
condition, the next stage following the precedent stage is implementing another extraction
algorithm under another condition to extract the results. Nguyen's as from the title teaches
segmentation, grouping and feature detection for face image analysis. Nguyen recites all the
claimed limitations of claim 1 and other similar claims, as it can be seen from the figure 2,
where a shape of the specified image subject using an ellipse is extracted in the stage before
(precedent stage) the extraction of the eyes, nose, etc which is the succeeding stage under
different condition of extraction. However, to further support this well known technique of
extracting a shape of regular geometric form of the specified image, examiner cited Saber.
Both Saber and Nguyen are directed to the same field of endeavor and they solve the same
problem in the same field, therefore examiner asserts it would have been obvious for one of
ordinary skill in the art at the time of invention was made to combine both references, if
needed, as per the motivation reasons provided in the rejection of the respective claims
before. Also, Applicant has agreed to the fact that an ellipse (a standard geometric form) has
been used by Nguyen on page 20 of the amendment filed April 25, 2005 in first paragraph
which recites "an ellipse is not used in Nguyen until after a silhouette of a head image is

obtained by course-level edge-based segmentation". Examiner, as previously discussed, asserts that image segmentation is required to identify the human face in the image, if extraction is to be dome using a system. Examiner further asserts that applicant's argument that if both references when combined, would result in improper detection of the image desired, is not persuasive as per the reasons provided earlier, as one of ordinary skill in the art would use image segmentation for identifying the subject in an image rather than directly extracting the subject image in the image when using a system.

7.   In the 3rd and 4th paragraph of the page 21, Applicant argues in substance:

        c. **"Claim 27 and similarly claim 40 recites that the subsequent stage comprises "detecting a color or hue of the specified image subject. There is no indication that the subsequent stage comprises detecting a color or hue of the specified image subject".**

        Examiner respectfully disagrees. Examiner cited (Section 1.3, Color-based segmentation, feature detection). Applicant argues that this information is provided by Cha reference not by Nguyen, however examiner here asserts that this teaching has been provided by Nguyen reference to which examiner points which belongs to Cha, which further provides the evidence that this technique of color analysis is well known prior to Nguyen's reference. For further support, examiner also directs to Nguyen on page 594, right column, first paragraph, where Nguyen teaches "Once the head image is obtained, skin region segmentation and feature detection proceed, mostly independently until the last stage. Various histogram analysis are carried out to estimate skin intensity levels and feature contrast.....". As well known, histogram analysis provides the color analysis of the image.

The above disclosure by Nguyen clearly teaches the use of histograms to calculate the skin intensity levels and feature contrast and as well known in the image processing art, the color or intensity range of an image varies from 0 to 255 where 0 being black and 255 being white and all other colors being in between 0 and 255 and this range is determined by using histograms. Also as discussed before, Saber does teach the use of color segmentation.

8.   Applicant's arguments regarding the prior art rejections on claims 28 and 29 under Nguyen, Saber and Hasegawa on page 24 of the Amendment filed on April 25, 2005, have been fully considered but are not persuasive.

9.   In the 4th paragraph of the page 20, Applicant argues in substance:

b. "Although the experiments in Hasegawa are performed in a standard indoor environment in the day time and in the evening, there is no indication that a predetermined extracting condition of a precedent stage comprises electronic or backlight information".

Examiner respectfully disagrees. A system performs a image processing to detect and extract the face from the human and the lighting conditions are merged into the image when the image is taken or produced, not at the time when system extracts the face, therefore makes the merged light information a predetermined extracting condition. Hasegawa clearly in Section 5.1.1 teaches of different light variations (day or evening) in which image is taken and face is extracted. An electronic flashlight and backlight is another way of producing similar kind of light variations and the system doesn't care where the light comes from, it will extract the image in different light variations. Further adding more emphasis, Nguyen also

teaches compensation for merged lightning effects (page 594, right column, 2nd paragraph)

regardless of the kind of light source.

Claim Rejections - 35 USC § 102

10.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use
> or on sale in this country, more than one year prior to the date of application for patent in the United States.

11.   Claims 15-26, 38, 39, 45, 46 and 57-58 are rejected under 35 U.S.C. 102(b) as being

anticipated by Saber et al (Face Detection and Facial Feature Extraction Using Color, Shape

and Symmetry-based Cost Functions; IEEE Proceedings on Pattern Recognition, ISBN:

1015-4651).

Regarding **Claim 15**, Saber et al disclose a method of extracting a specified image

subject, comprising the steps of:

performing image subject extraction processing by a specified image subject

extracting algorithm or algorithms for each extraction area to extract a plurality of extraction

areas as candidate specified image subject regions. (Figures 1-3; Pages 656-657, Section 2,

Sub-sections 2.1-2.4, skin/non-skin classification and shape classification algorithms). Saber

teaches that once the face pattern is identified and extracted, eyes, nose and mouth can be

extracted and this further has been emphasized by Saber in figures 1, 2 and 3, **thus**

conforming to the limitation "for each extraction area a plurality of extraction areas

as candidate image subject regions" as recited in claim 15.;

performing a vote in an N-dimensional space of an image characteristic quantity for each extraction area extracted by said specified image subject extracting algorithm or algorithms (Figures 1-3; Pages 656-657, Section 2, Sub-section 2.5, cost function (5)); and

performing weighting of degree of certainty as a specified image subject based on an aggregation value of the vote within a section area for aggregation in said N-dimensional space (Figures 1-3; Pages 656-657, Section 2, Sub-section 2.5, cost function Formula (5), weighted combination of the cost function) Formula (10)),

wherein a first extraction area is extracted according to a shape of regular geometric form of the specified image object (Figures 2 and 3; Page 655, Section 2. Skin region has been extracted by fitting an ellipse to the skin region, i.e., extracting face as a regular geometric form or ellipse.).

Regarding **Claim 16**, Saber et al further disclose the method of extracting the specified image subject according to claim 15, wherein said image subject extraction processing by said specified image subject extracting algorithm or algorithms is performed through dividing it into a plurality of stages (Figures 1-3; Pages 656-657, Section 2, Sub-section 2.5, plurality of stages for eye, nose and mouth localization, and further plurality of stages based on cost functions C_n^1, C_n^2, C_n^3 for eye detection); and

said image subject extraction processing in a subsequent stage is preferentially applied to an extraction area in which said aggregation value in the voting space of

said image characteristic quantity exceeds a predetermined value (Figures 1-5; Pages 656-658, Section 2, Sub-section 2.5, Thresholds t_1 and t_2).

Regarding **Claim 17**, Saber et al further disclose the method of extracting the specified image subject according to Claim 15, wherein said specified image subject

extraction processing by said specified image subject extracting algorithm or algorithms is performed through dividing it into a plurality of stages (Figures 1-3; Pages 656-657, Section 2, Sub-section 2.5, plurality of stages for eye, nose and mouth localization); and said image subject extraction processing in a subsequent stage is preferentially applied to an extraction area corresponding to said section area for aggregation within a preferential frame in the voting space of said image characteristic quantity (Figures 1-5; Pages 656-657, Section 2, Sub-section 2.5).

Regarding **Claim 18**, Saber et al further disclose the method of extracting the specified image subject according to Claim 15, wherein a combination of a plurality of image characteristic quantities selected from the group consisting of a position, size, direction or orientation of an extraction area and, a posture, density or color tint of an image subject is used as the N-dimensional space of said image characteristic quantity (Figures 1-5; Pages 656-657, Section 2, Sub-sections 2.1-2.5. Skin/non-skin classification and shape classification algorithms implement a plurality of image characteristic quantities consisting of position, size, direction or orientation of an extraction area (Face, Eye, Nose and Mouth) and, a posture, density or color tint of an image subject (Skin-non-skin color classification in YES color space).).

Regarding **Claim 19**, Saber et al further disclose the method of extracting the specified image subject according to Claim 15, wherein weighting value lowering processing is applied to a region within a predetermined area on a specific characteristic axis with respect to a neighborhood of the region, in which said aggregation value became large, in said N-dimensional characteristic stage (Figures 1-5; Pages 656-657, Section 2, Sub-sections 2.4-2.5. Principal axes of the elliptical skin classified region in N-dimensional eigenspace.

Eyes are located on a line which is parallel to the minor axis represented by the direction of

the eigenvector corresponding to the smaller eigenvalues. Finding the minimum of the cost

function in the eye region on horizontal minor axis is the weighting value lowering

processing (Page 657, Formula (8)).

Regarding **Claim 20**, it is a conventional methodology in statistical decision

processing to remove a remarkably large size or a remarkably small size from extraction data

to increase the accuracy and reliability of extracting the subjects for recognition or

classification purposes (Official Notice). Assigning lower values (sometimes even zero

value) of weighting factors to the extracted data having large or small size in comparison to

the mean value of the observed population of the data (outlier data), will remove a

remarkably large size or a remarkably small size from extraction data.

With regards to **Claim 21**, arguments analogous to those presented for Claim 15 are

applicable to Claim 21.

With regards to **Claim 22**, arguments analogous to those presented for Claim 16 are

applicable to Claim 22.

With regards to **Claim 23**, arguments analogous to those presented for Claim 17 are

applicable to Claim 23.

With regards to **Claim 24**, arguments analogous to those presented for Claim 18 are

applicable to Claim 24.

With regards to **Claim 25**, arguments analogous to those presented for Claim 19 are

applicable to Claim 25.

With regards to **Claim 26**, arguments analogous to those presented for Claim 20 are

applicable to Claim 26.

Regarding **Claim 38**, Saber further disclose a method of extracting a specified image

subject according to Claim 15, wherein said vote comprises an aggregation of points

indicative of the specified image subject (Section 2.5, centroids of the "holes" within the skin

segmentation mask).

With regards to **Claim 39**, arguments analogous to those presented for Claim 38 are

applicable to Claim 39.

Regarding **Claim 45**, Saber et al further disclose a method of extracting a specified

image subject according to Claim 15, wherein said regular geometric form is circular or

elliptical (Figures 2 and 3; Page 655, Section 2.).

With regards to **Claim 46**, arguments analogous to those presented for Claim 45 are

applicable to Claim 46.

Regarding claims **57 and 58**, claims 57 and 58 have been similarly analyzed and

rejected as per claim 15.

Claim Rejections - 35 USC § 103

12.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth
> in section 102 of this title, if the differences between the subject matter sought to be patented and the prior
> art are such that the subject matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be
> negatived by the manner in which the invention was made.

13.   Claims 1, 8, 27, 40, 41, 43, 47-51, 53 and 59-61 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Nguyen et al (Segmentation, Grouping and feature Detection for

Face Analysis; IEEE Proceedings in Computer Vision, ISBN: 0-8186-7190-4) in view of

Saber et al (Face Detection and Facial Feature Extraction Using Color, Shape and

Symmetry-based Cost Functions; IEEE Proceedings on Pattern Recognition, ISBN: 1015-4651).

Regarding Claim 1, Nguyen et al disclose a method of extracting a specified image subject which successively implements a plurality of specified image subject extracting algorithms, comprising the steps of:

implementing an extracting algorithm of a precedent stage under a predetermined extracting condition to obtain an extraction result (Figure 1, connected component labeling to create a silhouette and extracting a head image; Page 594, Section 2.2);

changing an extracting condition of a subsequent stage so as to be adapted to the thus obtained extraction result (Figure 1, skin segmentation and face-orientation; Page 594, Section 2.2); and

implementing an extracting algorithm of said subsequent stage under the thus changed extracting condition (Figures 3-6, Pages 596-598; first and second columns in Figure 3),

wherein said precedent stage comprises extracting a shape of specified image subject (Figure 2, extraction of silhouette and head image).

Nguyen et al do not explicitly disclose extracting a shape of regular geometric form of the specified image object in precedent stage.

Saber et al disclose a face detection and facial feature extraction comprising extracting a shape of regular geometric form of the specified image object (Page 655, Section 2. Skin region has been extracted by fitting an ellipse to the skin region, i.e., extracting face as a regular geometric form or ellipse.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Nguyen et al invention according to the teachings of Saber et al to extract a shape of regular geometric form of the specified image object in precedent stage because the regular geometrical shapes of human faces constitute the most accurate features to be utilized as attributes in facial image analysis.

With regards to **Claim 8**, arguments analogous to those presented for the corresponding limitations of this claim in Claim 1 are applicable to Claim 8.

With regards to **Claim 27**, arguments analogous to those presented for the corresponding limitation of this claim in Claim 1 are applicable to Claim 27.

Regarding **Claim 40**, Nguyen et al further disclose a method of extracting a specified image subject according to Claim 1, wherein said subsequent stage comprises detecting a color or hue of the specified image subject (Section 1.3, Color-based segmentation, feature detection).

Regarding **Claim 41**, Saber et al further disclose a method of extracting a specified image subject according to Claim 1, wherein said regular geometric form is circular or elliptical (Figures 2 and 3; Page 655, Section 2.).

With regards to **Claim 43**, arguments analogous to those presented for Claim 41 are applicable to Claim 43.

Regarding **claim 47**, claim 47 has been similarly analyzed and rejected as per claim 1.

Regarding **claim 48**, as discussed before, Nguyen teaches face recognition where a face contour is generated, skin segmentation is performed to further extract plurality of regions in the face area and further performs histogram analysis on the skin intensity levels to better find skin areas (section 2.3). Color of human skin is well known to be known by a

person of ordinary skill in the art and therefore examiner asserts it would have been obvious for one of ordinary skill in the art at the time of invention was made to use this predetermined color of human skin as a face extracting condition to further enhance the histogram analysis for face extraction with a higher probability of extracting a human face. Further as well known in the image processing art, the color or intensity range of an image varies from 0 to 255 where 0 being black and 255 being white and all other colors being in between 0 and 255 and this range is determined by using histograms and clearly the skin color according to the histogram would lie between 0 and 255 in gray range based on the average color rather than being strictly predetermined skin color. Also, Saber clearly provides the teachings that Chang (prior art) proposed a color segmentation and thresholding based algorithm to pinpoint the eyes, nostrils and mouth in color "head and shoulder" images. The skin segmentation is performed on a pixel-by-pixel basis, where a pixel is classified as skin if its chromaticity falls within a certain region of the chromaticity space (page 654, right column).

Regarding **claim 49**, claim 49 has been similarly analyzed and rejected as per claim 48.

Regarding **claim 50**, as discussed in the rejection of claim 48 both Nguyen and Saber clearly teaches segmentation of the whole image to extract the human face and then further teaches the extraction of extraction of eyes, nose etc. As well known in the art, different threshold levels are required for extracting different parts of the image. Examiner here provides examples with respect to this well known concept of image segmentation. When face is to be extracted from the whole image, the face is first of all required to be identified and that is done using binarization to detect the edges, which is done by

comparing to a particular threshold value, again this is a very well known technique in the image processing art. Further once the face is extracted, if to extract eyes, nose and other features of face, different threshold value is to be used against which the pixel values cab be compared that belong to the same skin regions of the face and this is further taught by Saber. Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention was made to use a well known concept of segmentation to select different threshold values to clearly differentiate between different parts of the face regions and it is totally a user choice of what threshold value is to be used according to the design choice.

Regarding **claim 51**, clustering as well known is nothing but segmentation based on threshold and has been defined by both Nguyen and Saber which further teach extracting each of the regions for further analysis as discussed in the rejection of claims 1 and 47-50.

Claim 53 has been analyzed and rejected as per claims 1 and 8. .

Claims 59-61 has been similarly analyzed and rejected as per claims 15, 21, 47-51 and the response to the arguments with respect to applicant's arguments.

14.   Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al (Segmentation, Grouping and feature Detection for Face Analysis; IEEE Proceedings in Computer Vision, ISBN: 0-8186-7190-4) in view of Saber et al (Face Detection and Facial Feature Extraction Using Color, Shape and Symmetry-based Cost Functions; IEEE Proceedings on Pattern Recognition, ISBN: 1015-4651) and Hasegawa et al (Real-time Parallel and Cooperative Recognition of Facial Images for an Interactive Visual Human Interface; IEEE Paper ISBN: 1051-4651).

Regarding **Claim 28**, Nguyen et al and Saber et al do not explicitly disclose a method of extracting a specified image subject according to Claim 1, wherein said predetermined extracting condition comprises electronic flash or backlight information.

Hasegawa et al disclose a real-time face recognition system comprising extraction condition regarding backlight (Page 386, Section 5.1.1, day time and evening lighting conditions).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Nguyen et al and Saber et al combination according to the teachings of Hasegawa et al to consider electronic flash or backlight information as one of the feature extraction parameters because it will compensate for environmental or ambient brightness changes and will provide more accurate recognition results.

With regards to **Claim 29**, arguments analogous to those presented for Claim 28 are applicable to Claim 29.

Allowable Subject Matter

Reasons for Allowance:

15.   Claims 2-7, 9-14, 30-37, 42, 44, 52 and 54-56 are allowed.

The following is an examiner's statement of reasons for allowance:

In regards to independent **claims 2 and 9**, the reasons for allowance should be evident from the applicant's argument in 2nd last paragraph on page 22 of amendment filed on April 25, 2005. The prior art of record does not teach the limitation: "qualifying respective extraction processing conditions of said plurality of specified image subject

extracting algorithms in a subsequent stage according to the respective extracting states in a

precedent stage" as recited in claims 2 and 9. Therefore claim 2 and 9 are allowed. All other

claims depending on claims 2 and 9 are allowed at least by dependency on claims 2 and 9.

Any comments considered necessary by applicant must be submitted no later than

the payment of the issue fee and, to provide processing delays, should preferably accompany

the issue fee. Such submissions should be clearly labeled "Comments on Statement of

Reasons for Allowance".

Conclusion

16.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

- Matsuo et al., U.S. Patent No. 6,697,503, discloses a device and method for
  face image extraction, and recording medium having recorded program for
  the method.

- Benati et al., U.S. Patent No. 5,432,863, discloses automated detection and
  correction of eye color defects due to flash illumination.

- Tamura et al., U.S. Patent No. 6,040,860, discloses imaging apparatus for
  supplying images with rich gradation across the entire luminance range for all
  subject types.

- Kinjo, U.S. Patent No. 5,629,752, discloses a method of determining an
  exposure amount using optical recognition of facial features.

Applicant's amendments to the claims and addition of new claims necessitated the

new ground(s) of rejection presented in this office action. **Accordingly, THIS ACTION**

IS MADE FINAL. See MPEP §706.07(a). Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed

until after the end of the THREE-MONTH shortened statutory period, then the shortened

statutory period will expire on the date the advisory action is mailed, and any extension fee

pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action.

In no event, however, will the statutory period for reply expire later than SIX MONTHS

from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Manav Seth whose telephone number is (571) 272-7456.

The examiner can normally be reached on Monday to Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information

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access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-

217-9197 (toll-free).

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September 06, 2005